

What is claimed is:

1. A mixed metal oxide of the formula  $AXO_3$  where
  - A is at least one element selected from the elements of group 1, 2 and 3 of the periodic table,
  - X is at least one element selected from the elements cerium (Ce) and the elements of group 4, 7, 13 and 14 of the periodic table,and mixtures of such mixed metal oxides.
2. The mixed metal oxide as claimed in claim 1, characterized in that the particle size of the mixed metal oxide is in the nanoscale range.
3. The mixed metal oxide as claimed in claim 2, characterized in that the particle size of the mixed metal oxide is  $< 100$  nm, preferably  $< 50$  nm.
4. The mixed metal oxide as claimed in one of the preceding claims, characterized in that the mixed metal oxide is doped.
5. The mixed metal oxide as claimed in claim 4, characterized in that at least one element selected from the elements of group 3, 10, 11, 12 and 13 of the periodic table and the lanthanoids is present for doping.
6. The mixed metal oxide as claimed in claim 5, characterized in that the doping element is copper.
7. The mixed metal oxide as claimed in one of claims 4 to 6, characterized in that the content of doping elements is between 0.01 and 20 atom%, preferably between 0.1 and 10 atom%, in particular between 1 and 6 atom%.

- 5 8. The mixed metal oxide as claimed in one of the preceding claims, characterized in that A is selected from the elements of group 2 of the periodic table, and is preferably barium (Ba).
- 10 9. The mixed metal oxide as claimed in one of the preceding claims, characterized in that A is lithium (Li).
- 10 10. The mixed metal oxide as claimed in one of the preceding claims, characterized in that A is lanthanum (La) or Yttrium (Y).
- 15 11. The mixed metal oxide as claimed in one of the preceding claims, characterized in that X is cerium (Ce).
- 20 12. The mixed metal oxide as claimed in one of the preceding claims, characterized in that X is titanium (Ti) or zirconium (Zr).
- 25 13. The mixed metal oxide as claimed in one of the preceding claims, characterized in that X is manganese (Mn).
- 30 14. The mixed metal oxide as claimed in one of the preceding claims, characterized in that X is indium (In).
- 30 15. The mixed metal oxide as claimed in one of the preceding claims, characterized in that X is tin (Sn).
- 35 16. The mixed metal oxide as claimed in one of the preceding claims with the formula  $BaXO_3$  where X is cerium (Ce).

17. The mixed metal oxide as claimed in claim 16, characterized in that the mixed metal oxide is doped, the doping element preferably being copper.
- 5 18. The mixed metal oxide as claimed in one of the preceding claims, preparable by the so-called single-source precursor technique.
- 10 19. The use of the mixed metal oxides as claimed in one of the preceding claims for detecting gases, preferably for detecting incombustible gases.
20. The use as claimed in claim 19, characterized in that the gas is carbon dioxide (CO<sub>2</sub>).
- 15 21. The mixed metal oxide as claimed in one of claims 1 to 18, characterized in that it is applied to a substrate and/or incorporated into a substrate.
- 20 22. The mixed metal oxide as claimed in claim 21, characterized in that the substrate is a substrate for sensors, in particular for gas sensors.
- 25 23. A sensor, preferably sensor for the detection of gases, characterized in that it comprises a mixed metal oxide as claimed in one of claims 1 to 18, and is preferably coated with such a mixed metal oxide.
- 30 24. A process for preparing mixed metal oxides as claimed in one of claims 1 to 18, characterized in that a mixed metal alkoxide whose stoichiometry and structure are adjusted to the mixed metal oxide to be prepared is prepared with the aid of the so-called single-source precursor technique, and this mixed metal alkoxide, optionally after a doping step, is hydrolyzed to the mixed metal oxide.
- 35

25. A mixed metal alkoxide as an isolated intermediate in the process as claimed in claim 24.